The Poetics of Augmented Space: Learning from Prada

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Augmented Space

The 1990s were about the virtual. We were fascinated by new virtual spaces made possible by computer technologies. The images of an escape into a virtual space that leaves the physical space useless and of cyberspace – a virtual world that exists in parallel to our world – dominated the decade. It started with the media obsession with Virtual Reality (VR). In the middle of the decade graphical browsers for World Wide Web made cyberspace a reality for millions of users. During the second part of the 1990s yet another virtual phenomenon – dot coms – rose to prominence, only to be crashed by the real world laws of economics. By the end of the decade, the daily dose of cyberspace – using Internet to make plane reservations, to check email using Hotmail account, or to download MP3 files – became such a norm that the original wonder of cyberspace so present in the early cyberpunk fiction of the 1980s and still evident in the original manifestos of VRML evangelists of the early 1990s was almost completely lost.[1] The virtual became domesticated: filled with advertisements, controlled by big brands, and rendered harmless. In short, to use the expression of Norman Klein, it became an "electronic suburb."

It is quite possible that this decade of the 2000s will turn out to be about the physical – that is, physical space filled with electronic and visual information. While enabling further development of virtual spaces – from more realistic computer games to new 3D technologies and standards for World Wide Web such as Director 3D to wider employment of compositing in cinema – computer and network technologies more and more actively enter our real physical spaces. The previous image of a computer era – VR user traveling in a virtual space – has become replaced by a new image: a person checking her email or making a phone call using her PDA / cell phone combo while at the airport, on the street, in a car, or in any other actually existing space. But this is just one example of what I see as a larger trend. Here are a few more examples of the technologies which deliver data

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[1] VRML stands for Virtual Reality Modeling Language. In the first part of the 1990s the inventors of this language designed to model and access 3-D interactive virtual worlds over Internet, promoted it as the material realization of the idea of cyberspace. (See, for instance, Mark Pesce, "Ontos, Eros, Noos, Logos," keynote address for ISEA (International Symposium on Electronic Arts) 1995, http://www.xs4all.nl/~mpesce/iseakey.html.) As of this writing (May 2002), Internet-based 3-D virtual worlds still failed to become popular.

to, or extract data from, physical space – and which already are widely employed at the time of this writing (early 2002):

1. Video surveillance is becoming ubiquitous, employed in mass no longer by governments, military and businesses but also by the individuals; cheap, tiny, wireless and Net-enabled, video cameras can now be put almost anywhere (for instance, by 2002 many taxi cabs already had video cameras continuously recording the inside of the car).

2. If video and other types of surveillance technologies translate the physical space and its dwellers into data, *cellspace technologies* work in the opposite direction: delivering data to the mobile space dwellers. Cellspace is physical space "filled" with data that can be retrieved by a user using a personal communication device.[2] Some data may come from global networks such as Internet; some may be imbedded in objects located in the space around the user. Moreover, while some data may be available regardless of where the user is in the space, it can be also location specific. The examples of cellspace applications include using GPS to determine your coordinates; or using a cell phone to check in at the airport, to pay for the road tool; or to retrieve information about a product in a store.[3]

3. While we can think of cellspace as the invisible layer of information which is overlaid over the physical space and which is customized by an individual user, publicly located *computer / video displays* present the same visible information to passersbys. These displays are gradually becoming larger and flatter; they are no longer confined to flat surfaces; they no longer require darkness to be visible. In the short term we may expect large and thin displays to become more pervasive in both private and public spaces (perhaps using technology such as e-ink); in the longer term every object may become a screen connected to the Net, with the whole of built space becoming a set of display surfaces.[4] Of course physical space was always augmented by images, graphics and type; but substituting all these by electronic displays makes possible to present dynamic images, to mix images, graphics and type and to change the content at any time.

Popular media normally does not discuss these three technologies together because they belong to different industries (electronics, computers) and different markets (consumer, professional). But from the point of view of their effect on our concept of space and, consequently, our lives as far as they are lived in various spaces, I feel that they very much belong together. They make the physical space into a dataspace: extracting data from it (surveillance) or augmenting it with data (cellspace, computer displays).

It is also make sense to bring surveillance / monitoring of space and its dwellers and augmentation of space with additional data because these two

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[2] Coined in 1998 by David S. Bennahum, the term "cellspace" originally referred to the new then ability to access e-mail or Internet wirelessly. Here I am using the term in a broader sense.

[3] It is interesting to think of GPS (Global Positioning System) as a particular case of cellspace. Rather than being tied up to an object or a building, here the information is a property of the Earth as a whole. A user equipped with a GPS receiver can retrieve particular type of information relative to the location of the user – the coordinates of this location. GPS gradually are being integrated into various telecommunication and transportation technologies, from cell phones to PDA to cars.

[4] Recall the opening scene of *Blade Runner* (1982) where the whole side of a hi-rise building acts as a screen.

functions often go hand in hand. For instance, by knowing the location of a person equipped with a cell phone particular information relevant to this location can be send to this cell phone. Similar relationship exists in the case of software agents, affective computing, and similar interfaces which take a more active role in assisting the user when the standard Graphical User Interface (GUI). By tracking the user – her mood, her pattern of work, her focus of attention, her interests, and so on – these interfaces acquire information that they use to help the user with her tasks and automate them. This close connection between surveillance and assistance is one of the key characteristics of the high-tech society. This is how these technologies are made to work, and this is why I am discussing data flows from the space (surveillance, monitoring, tracking) and into the space (cellspace applications, computer screens and other examples below) together.

Lets now add to these three examples of the technologies already at work a number of research paradigms actively conducted in Universities and industry labs. (Note that many of them overlap, mining the same territory but with a somewhat different emphasis.) We can expect that at least some of them will become a reality during this decade:

4. *Ubiquitous Computing*: the original move (1990-) at Xerox Parc away from computing centered in desktop machines towards small multiple devices distributed throughout the space.[5]

5. *Augmented Reality*: another paradigm which originated around the same time – overlaying dynamic and context-specific information over the visual field of a user (see below for more details).[6]

6. *Tangible Interfaces*: treating the whole of physical space around the user as part of human-computer interface (HCI) by employing physical objects as carrier of information.[7]

7. *Wearable Computers*: imbedding computing and telecommunication devices into the clothing.

8. *Intelligent Buildings* (or *Intelligent Architecture*): buildings wired to provide cellspace applications.

9. *Intelligent Spaces*: spaces that monitored the users interact with them via multiple channels and provide assistance for information retrieval, collaboration and other tasks (think of Hal in *2001*).[8]

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[5] M. Weiser, "The computer for the twenty-first century," *Scientific American*, 265(3):94–104, September 1991.

[6] W. MacKay, G. Velay, K. Carter, C. Ma, and D. Pagani, "Augmenting reality: Adding computational dimensions to paper," *Communications of the ACM*, 36(7):96–97, 1993. Kevin Bonsor, "How Augmented Reality Will Work" http://www.howstuffworks.com/augmented-reality.htm.

[7] See Tangible Bits project at MIT Media Lab, http://tangible.media.mit.edu/projects/Tangible_Bits/projects.htm.

[8] Guido Appenzeller, Intelligent Space Project (http://gunpowder.Stanford.EDU/~appenz/ISpace/); Intelligent Room Projects, AI Lab, MIT (http://www.ai.mit.edu/projects/iroom/projects.shtml).

10. *Context-aware Computing*: an umbrella term used to refer to all or some of the developments above, signaling a new paradigm in computer science and HCI fields.[9]

11. *Smart Objects*: objects connected to the Net; objects that can sense their users and display "smart" behavior.

12. *Wireless Location Services*: delivery of location specific data and services to portable wireless devices such as cell phones (i.e., similar to cellspace.)

13. *Sensor Networks*: networks of small sensors that can be used for surveillance, intelligent spaces, and similar applications.

14. *E-paper* (or *e-ink*): a very thin display on a sheet of plastic which can be flexed in diffirent shapes and which displays information recevied wirelessly.[10]

While the technologies imagined by these research paradigms accomplish this in a number of different ways, the end result is the same: overlaying layers of data over the physical space. I will use the term "augmented space" to refer to this new kind of space which is slowly becoming a reality. As I already mentioned, this overlaying is often made possible by tracking and monitoring the users; that is, delivering information to users in space and extracting information about these users are closely connected. Thus augmented space is also monitored space.

I derived the term "augmented space" from an older and already established term "augmented reality" (AR).[11] Coined around 1990, the concept of "augmented reality" is opposed to "virtual reality" (VR). With a typical VR system, all the work is done in a virtual space; physical space becomes unnecessary and its vision is completely blocked. In contrast, AR system helps the user to do the work in a physical space by augmenting this space with additional information. This is achieved by overlaying information over the user's visual field. An early scenario of a possible AR application developed at Xerox Parc involved a copier repairman wearing a special display that overlaid a wireframe image of copier insides over the actual copier the repairman was working on. Today the scenarios for a everyday use are imagined as well: for instance, a tourist with AR glasses which overlay dynamically changing information about the sites in the city over her visual field. In this new iteration, AR becomes conceptually similar to wireless location services. The idea shared by both is that when the user is in the vicinity of objects, buildings or people, the information about them is delivered to the user – but if in cellspace it is displayed on a cell phone or PDA, in AR it is overlaid over user's visual field.

The demise of popularity of VR in mass media and the slow but steady rise in AR-related research in the last five years is one example of how augmented space paradigm is taking over virtual space paradigm.[12] As we saw, if we use these

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[9] Tom Moran and Paul Dourish, "Introduction to special issue on context-aware computing, "*Human Computer Interaction*, 16:108, 2001.

[10] Ivan Noble, "E-paper moves a step nearer," *BBC News Online*, 23 April, 2001 (http://news.bbc.co.uk/hi/english/sci/tech/newsid_1292000/1292852.stm).

[11] For AR research sites and conferences, see http://www.augmented-reality.org.

[12] Interestingly, this reversal can be said to be prefigured in the very origins of VR. In the late 1960s Ivan Sutherland developed what came down in history as the first VR system. The user of the system saw a simple wireframe cube whose perspectival view would change as the user moved his head. The wireframe cube appeared overlaid over whatever the user was seeing. Because the idea of a 3-D computer graphics display whose perspective changes in real time according to the position of the user became associated with subsequent virtual reality systems,

system for work, VR and AR - the virtual and the augmented - are the opposites of each other: in the first case the user works on a virtual simulation, in the second she works on actual things in actual space. Because of this, a typical VR system presents a user with a virtual space that has nothing to do with the immediate physical space of the user; in contrast, a typical AR system adds the information directly related to this immediate physical space. But we don't necessarily have to think of immersion into the virtual and augmentation of the physical as the opposites. One level, the difference whether we can think of a particular situation as an immersion or as augmentation is simply a matter of scale, i.e. the relative size of a display. When you are watch a movie in a movie theatre or on big TV set or playing a computer game on a game console connected to this TV, you are hardly aware of your physical surroundings; practically speaking, you are immersed in virtual reality. But when you watching the same movie or play the same game on a small display of a cell phone / PDA which fits in you hand, the experience is different: your are still largely present in physical space; the display adds to your overall phenomenological experience but it does not take over. So it all depends on how we understand the idea of addition: we may add additional information to our experience – or we may add an altogether different experience.

"Augmented space" may bring associations with one of the founding ideas of computer culture: Douglas Engelbardt's concept of a computer augmenting human intellect, articulated fourty years ago.[13] This association is appropriate, but we need to be aware of the differences as well. The vision of Engelbardt and the related visions of Vannevar Bush and J.C.R. Licklider assumed a stationary user – a scientist or engineer working in his office. Revolutionary for their time, these ideas anticipated the paradigm of desktop computing. Today, however, we are gradually moving into the next paradigm where computing and telecommunication are delivered to a mobile user. And while it is still more efficient to run CAD, 3D modeling, or Web design software while sitting in a comfortable chair in front of a 22 inch LCD display, many other types of computing and telecommunication activities do not require being stationary. Thus augmenting the human also comes to mean augmenting the whole space in which she lives or through which she passes by.

Augmented Architecture

In the 1990s, computer hardware manufacturers and computer game industry drove the development of applications that use 3-D interactive virtual spaces such as computer games. While today's PC are already too fast for practically all the applications needed for a typical home or business user, real time rendering of the detailed simulated worlds still can use faster machines; it also requires special graphics cards. The industry therefore has a direct interest in continuously fueling

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Sutherland is credited with inventing the first VR system. But it can be also argued that his was not a VR system but AR system because the virtual display was overlaid over the user's field of vision without blocking it. In other words, in Sutherland's system new information was added to the physical environment: a virtual cube.

13 Vannevar Bush, "As We May Think" (1945); Douglas Engelbart, "Augmenting Human Intellect: A Conceptual Framework" (1962). Both in Noah Wardrip-Fruin and Nick Montfort, eds., *The New Media Reader* (MIT Press, forthcoming 2002.)

the interest of the consumers in more and more "realistic" virtual spaces – because this is what justifies the sales of new computer hardware.

Augmented space research has the potential for many commercial, consumer and military applications, and thus it receives funding from diverse groups. Ultimately, it is probably of most concern to the huge telecom industry. So if the computer industry thrives on sales on new PCs and graphics boards needed to run latest computer games, the telecom industry is interested in selling new generations of cell phones and PDA which will provide multimedia, e-commerce, and wireless location services – and of course getting huge gains from charging the users for these services.

So much for economics. But what about the phenomenological experience of being in a new augmented space? What about its cultural applications? What about its poetics and aesthetics? One way to begin thinking about these questions is to approach the design of augmented space as an architectural problem. Augmented space provides a challenge and opportunity for many architects to rethink their practice, since architecture will have to take into account that layers of contextual information will overlay the built space.

But is this a completely new challenge for architecture? If we assume that the overlaying of different spaces is a conceptual problem not connected to any particular technology, we may start thinking about which architects and artists have already been working on this problem. To put this in a different way, overlaying dynamic and contextual data over physical space is a particular case of a general aesthetic paradigm: how to combine different spaces together. Of course electronically augmented space is unique since information is personalized for every user, since it can change dynamically over time, since it is delivered through an interactive multimedia interface, etc. Yet it is crucial to see it as a conceptual rather than just as a technological issue, as something that already was often a part of other architectural and artistic paradigms.

Augmented space research gives us new terms to think about previous spatial practices. If before we would think of an architect, a fresco painter, or a display designer working to combine architecture and images, or architecture and text, or incorporating different symbolic systems in one spatial construction, we can now say that all of them were working on the problem of augmented space: how to overlay layers of data over physical space. Therefore, in order to imagine what can be done culturally with augmented spaces, we may begin by combing previous cultural history for useful precedents.

To make my argument more accessible, I have chosen as my examples two well-known contemporary figures. Janet Cardiff is a Canadian artist who became famous for her "audio walks." She creates her pieces by following a trajectory through some space and narrating an audio track that combines instructions to the user ("go down the stairs"; "look into the window"; "go through the door on the right") with narrative fragments, sound effects and other aural "data." To experience the piece, the user puts on earphones connected to a CD player, and follows Cardiff's instructions.[14] In my view her "walks" represent the best realization of augmented space paradigm so far - even though Cardiff do not use any sophisticated computer, networking and projection technologies. Cardiff's "walks" show the aesthetic potential of overlaying a new information space over a physical space. The power of these "walks" lies in the interactions between the two spaces - between vision and hearing (what the user is seeing and what she is

[14] I only experienced one of her "walks" which she created for P.S. 1 in New York in 2001.

hearing), and between present and past (the time of user's walk versus the audio narration which like any media recording belongs to some undefined time in the past).

Jewish Museum Berlin by Daniel Liberskind can be thought of as another example of augmented space research. If Cardiff overlays a new data space over the existing architecture and/or landscape, Liberskind uses the existent data space to drive the new architecture he constructs. The architect put together a map that showed the addresses of Jews who were living in the neighborhood of the museum site before World War II. He then connected different points on the map together and projected the resulting net onto the surfaces of the building. The intersections of the net projection and the walls gave rise to multiple irregular windows. Cutting through the walls and the ceilings at different angles, the windows evoke many visual references: narrow eyepiece of a tank; windows of a medieval cathedral; exploded forms of the cubist/abstract/suprematist paintings of the 1910s-1920s. Just as in the case of Cardiff's audio walks, here the virtual becomes a powerful force that re-shapes the physical. In Jewish Museum the past literally cuts into the present. Rather than something ephemeral, an immaterial layer over the real space, here data space is materialized, becoming a sort of monumental sculpture.

White Cube as Cellspace

While we may interpret practice by selected architects and artists as having particular relevance to thinking of how augmented space can be used culturally and artistically, there is another way to link augmented space paradigm with modern culture. Here is how it works.

One trajectory which can be traced in the twentieth century art is from a two dimensional object placed on a wall towards the use of the whole 3D space of a gallery. (All other cultural trajectories in the twentieth century, this one is not a linear development; rather, it consists from steps forward and steps back, the rhythm which follows the general cultural and political outline of the twentieth century: highest peak of creativity in the 1910s-1920s, followed by a second, smaller peak in the 1960s). Already in the 1910s Tatlin's reliefs break the two-dimensional picture plane, exploding a painting into the 3D dimension. In the 1920s, Lissitzky, Rodchenko and others moved away from an individual painting / sculpture towards thinking of a whole white cube as one singular surface – yet their exhibitions activate only the walls rather than the whole space.

In the mid-1950s, assemblage legitimized the idea of an art object as a three dimensional construction (1961"The Art of Assemblage" MOMA exhibition). In the 1960s, minimalist sculptors (Carl Andre, Donald Judd, Robert Morris) and other artists (Eva Hesse, Arte Powera) finally start dealing with the whole of 3D space of a white cube. Beginning in the 1970s, installation (Dan Graham, Bruce Nauman) grows in importance to become in the 1980s the most common form of artistic practice of our times – and the only thing which all installations share is that they engage with 3D space. Finally, the white cube becomes a *cube* – rather than just a collection of surfaces.

What is the next logical step? For modern art, augmented space can be thought as the next step in the trajectory from a flat wall to a 3D space. For a few decades now artists have already dealt with the entire space of a gallery; rather than creating an object that a viewer would *look at*, they placed the viewer *inside* this object. Now, along with the museums, the artists have a new challenge: placing a

user inside a space filled with dynamic, contextual data with which the user can interact.

Moving Image in Space: Video Installations as Laboratory for the Future

Before we rush to conclude that the new technologies do not add anything substantially new to the old aesthetic paradigm of overlaying different spaces together, let me note that the new technologically implemented augmented spaces have one important difference from Cardiff's walks, Liberskind's Jewish museum, and similar works – in addition to their ability to deliver dynamic and interactive information. Rather than overlaying a new 3-D virtual dataspace over the physical space, Cardiff and Liberskind overlay only a two-dimensional plane, or a 3-D path, at best. Indeed, Cardiff's walks are new 3-D paths placed over an existing space; rather than complete spaces. Similarly, in Jewish Museum Berlin Liberskind projects 2-D map onto the 3-D shapes of his architecture.[15]

In contrast, GPS, wireless location services, surveillance technologies, and other augmented space technologies all define data space – if not in practice than at least in their imagination - as a *continuous* field completely extending over and filling in *all of* physical space. Every point in space has a GPS coordinate which can be obtained using GPS receiver. Similarly, in the cellspace paradigm every point in physical space can be said to contain some information that can be retrieved using PDA or a similar device. With surveillance, while in practice video cameras, satellites, Echelon (the set of monitoring stations which are operated by the U.S. and are used to monitoring all kinds of electronic communications globally), and other technologies so far can only reach some regions and layers of data but not others, the ultimate goal of the modern surveillance paradigm is to able to observe every point at every time. To use the terms of Borges's famous story, all these technologies want to make the map equal to the territory. And if, according to Michel Foucault's famous argument in *Discipline and Punish*, the modern subject internalizes surveillance, thus removing the need for anybody to be actually present in the center of the Panopticum to watch him/her, modern institutions of surveillance insist that s/he should be watched and tracked everywhere all the time.

It is important, however, that in practice data spaces are almost never continuous: surveillance cameras reach look at some spaces but not at others, wireless signal is stronger in some areas and non-existent in others, and so on. As Matt Locke eloquently describes this,

Mobile networks have to negotiate the archiecture of spaces that they attempt to inhabit. Although the interfaces have removed themselves from physical architectures, the radio waves that connect cell spaces are refracted and reflected by the same obstacles, creating not a seamless network but a series of ebbs and flows. The supposedly flat space of the network is in fact flat, puled into troughts

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[15] For whose readers familiar with these concepts, artistic augmented spaces I evoked can be thought as 2D texture maps while technological augmented spaces can be compared to a solid texture.

and peaks by the gravity of archiecture and the users themselves.[16]

This contrast between continuity of cellspace in theory and its discontinuity in practice should not be dismissed; rather, it itself can be the source of interesting aesthetics strategies.

My third example of already existing augmented space – electronic displays mounted in shops, streets, building's lobbies, train stations and apartments – follows different logic. Rather than overlaying all of the physical space, here data space occupies a well-defined part of the physical space. This is the tradition of the Alberti's window, and, consequently, post-Renaissance painting, cinema screen, and TV monitor. However, if until recently the screen usually acted as a window into a virtual 3-D space, in the past two decades of the 20th century it turned into a shallow surface in which 3-D images co-exist with 2-D design and typography. Live action footage shares space with motion graphics (titles), scrolling data (for instance, stock prices or weather) and 2-D design elements. In short, a Renaissance painting became a an animated Medieval illustrated book.

My starting point for the discussion of the poetics of thus type of augmented space will be the current practice of video installations that came to dominate art world in the 1990s. Typically, these installations use video or data projectors; they turn a whole wall or even a whole room into a display or a set of displays; thus rehearsing and investigating (willingly or not) the soon-to-come future of our apartments and cities when large and thin displays will become the norm. In the same time, these laboratories of the future are rooted in the past: the different traditions of "image within a space" of the twentieth century culture.

White Cube versus Black Box

Among different oppositions that have structured the culture of the twentieth century that we have inherited has been the opposition between an art gallery and a movie theatre. One was high culture; another was low culture. One was a white cube; another was a black box.

Given the economy of art production – one of a kind objects created by individual artists – twentieth century artists spent lots of energy experimenting with what can be placed inside the neutral setting of a white cube: breaking away from a flat and rectangular frame by going into the third dimension; covering a whole floor; suspending objects from the ceiling; and so on. In other words, if we are to make an analogy between an art object and a digital computer, we can say that in modern art both "physical interface" and "software interface" of an art object were not fixed but open for experimentation. In other words, both the physical appearance of an object and the proposed mode of interaction with an object were open for experimentation. Artists have also experimented with the identity of a gallery: from a traditional space of aesthetic contemplation to a place for play, performance, public discussion, a lecture, and so on.

In contrast, since cinema was an industrial system of mass production and mass distribution, the physical interface of a movie theatre and software interface of a film itself were pretty much fixed. A 35 mm image of fixed dimensions projected on a screen with the same frame ratio; dark space where the viewers

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[16] Matt Locke, in *Mobile Minded*, eds. Geert Lovink and Mieke Gerritzen (Corte Madera, CA: Ginko Press, 2002), 111.

were positioned in a set of rows; a fixed time of a movie itself. Not accidentally, when in the 1960s experimental filmmakers started to systematically attack the conventions of traditional cinema, these attacks were aimed at both its physical interface and software interface (along, of course, with the content). Robert Breer projected his movies on a board that he would hold above his head as he moved through a movie theatre towards the projector; Stan VanderBeck contrasted semi-circular tents for projection of his films; etc.

The gallery was the space of refined high taste while the cinema served to provide entertainment for the masses, and this difference was also signified by what was acceptable in two kinds of spaces. Despite all the experimentation with its "interface," gallery space was primary reserved for static images; to see the moving images the public had to go a moving theatre. Thus until recently, moving image in a gallery was indeed an exception (Duchamp's rotoscopes, Acconci's masturbating performance).

Given this history, the 1990s phenomena of omni-present video installation taking over the gallery spaces goes against the whole paradigm of modern art – and not only because installations bring moving images into the gallery. Most video installations adopt the same physical interface: a dark enclosed or semi-enclosed rectangular space with video projector on one end and the projected image on the opposite wall. From a space of constant innovation in relation to physical and software interface of an art object, a gallery space has turned into what for almost its century was its ideological enemy – a movie theatre, characterized by the rigidity of its interface.

Many software designers and software artists – from Ted Nelson and Alan Kay to Perry Hoberman and IOD – revolt against the hegemony of mainstream computer interfaces, such as the keyboard and mouse, GUI, or commercial Web browsers. Similarly, the best of video, or more generally, moving image installation artists, go beyond the standard video installation interface - a dark room with an image on one wall. Examples include Diana Thater, Gary Hill, Doug Aitken, as well as the very first "video artist" – Nam Juke Paik. The founding moment of what came later to be called "video art" was Paik's attack on physical interface of a commercial moving image – his first show consisted of television with magnets attached to them, and TV monitors ripped open of their enclosures.

The Electronic Vernacular

When we look at what visual artists are doing with a moving image in a gallery setting in comparison with these other contemporary fields, we can see that the white gallery box still functions as a space of contemplation, quite different from the aggressive, surprising, overwhelming spaces of a boutique, trade show floor, an airport, or a retail/entertainment area of a major metropolis.[17] While a number of video artists continue the explorations of 1960s "expanded cinema" movement by pushing moving image interfaces in many interesting directions, outside of a gallery space we can find at least as rich field of experiments. I can single out three areas. First, contemporary urban architecture - in particular, many proposals of

[17] This passive and melancholic quality of video art was brilliantly staged in a recent exhibition design by LO/TEK for exhibition *Making Time: Considering Time as a Material in Contemporary Video & Film* in Hammer Museum in Los Angeles (February 4 - April 29, 2001). As Norman Klein pointed out to me, LO/TEK designed a kind of collective tomb - a cemetery for video art.

the last decade to incorporate large projection screens into architecture which would project the activity inside, such as Rem Koolhaas 1992 unrealized project for the new ZKM building in Karlsruhe; a number of projects, also mostly unrealized so far, by Robert Venturi to create what he calls "architecture as communication" (buildings covered with electronic displays); realized archiectural/media installations by Diller + Scofilio such as *Jump Cuts* and *Facsimile*[18]; the highly concentrated use of video screens and information displays in certain cities such as Seoul and Tokyo or in Time Square in NYC; and finally, imaginary future architecture as seen in movies from *Blade Runner* (1982) to *Minority Report* (2002) which uses electronic sreens on the scale not possible today Second is the use of video displays in trade show design such as in annual SIGGRAPH and E3 Conventions. The third is the best of retail environments (I will discuss this in more detail shortly).

The projects and theories of Robert Venturi deserve a special consideration since for him an electronic display is not an optional addition but the very center of architecture in information age. Since the 1960s Venturi continuously argued that architecture should learn from vernacular and commercial culture (billboards, Las Vegas, strip malls, architecture of the past). Appropriately, his books *Complexity and Contradiction in Architecture* and *Learning from Las Vegas* are often referred to as the founding documents of post-modern aesthetics. Venturi argued that we should refuse the modernist desire to impose minimalist ornament-free spaces, and instead embrace complexity, contradiction, heterogeneity and iconography in our build environments.[19] In the 1990s he articulated the new vision of "Architecture as communication for information age (rather than as space for the Industrial Age)."[20] Venturi wants us to think of "architecture as iconographic representation emitting electronic imagery from its surfaces day and night." Pointing out at some of the already mentioned examples of the aggressive incorporation of electronic displays in contemporary environments such as Time Square in NYC, and also arguing that traditional architecture *always* included ornament, iconography and visual narratives (for instance, a Medieval cathedral with its narrative window mosaics, narrative sculpture covering the façade, and the narrative paintings), Venturi proposed that architecture should return to its traditional definition as *information surface*. [21] Of course, if the messages communicated by traditional architecture were static and reflected the dominant ideology, today electronic dynamic interactive displays make possible for these messages to change continuously and to be the space of contestation and dialog, thus functioning as the material manifestation of the often invisible public sphere.

Although this has not been a part of Venturi's core vision, it is relevant to mention here a growing number of projects where the large publicly mounted screen is open for programming by the public who can send images via Internet, or

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[18] Overview of Diller + Scofilio projects can be found at http://www.labiennaledivenezia.net/it/archi/7mostra/architetti/diller/open.htm.

[19] Robert Venturi, *Complexity and Contradiction in Architecture* (New York: Museum of Modern Art, 1966); Robert Venturi, Denise Scott Brown, and Steven Izenour, *Learning from Las Vegas* (Cambridge, Mass.: MIT Press,1972.)

[20] Robert Venturi, *Iconography and Electronics upon a Generic Architecture : A View from the Drafting Room* (MIT Press, 1996).

[21] Robert Venturi in a dialog with George Legrady, Entertainment and Value Conference, University of California, Santa Barbara, May 4, 2002. The term "information surface" is mine.

choose information being displayed via their cell phones. Even more radical is *Vectorial Elevation, Relational Architecture #4* by artist Raffael Lozano-Hemmer[22] This project made possible for people from all over the world to control a mutant electronic architecture (made from search lights) in a Mexico City's square. To quote from the statement of the jury of Prix Ars Electronica 2002 which awarded this project Golden Nica at Ars Electronica 2002 in Interactive Art category:

Vectorial Elevation was a large scale interactive installation that transformed Mexico City's historic centre using robotic searchlights controlled over the Internet. Visitors to the project web site at <http://www.alzado.net> could design ephemeral light sculptures over the National Palace, City Hall, the Cathedral and the Templo Mayor Aztec ruins. The sculptures, made by 18 xenon searchlights located around the Zócalo Square, could be seen from a 10-mile radius and were sequentially rendered as they arrived over the Net.

The website featured a 3D-java interface that allowed participants to make a vectorial design over the city and see it virtually from any point of view. When the project server in Mexico received a submission, it was numbered and entered into a queue. Every six seconds the searchlights would orient themselves automatically and three webcams would take pictures to document a participant's design.[23]

Venturi's vision of "architecture as iconographic representation" is not without its problems. If we focus completely on the idea of architecture as information surface, we may forget that traditional architecture communicated messages and narratives not only through flat narrative surfaces but also through the particular articulation of space. To use the same example of a medieval cathedral, it communicated Christian narratives not only through it's the images covering its surfaces but also through its whole spatial structure. In the case of modernist architecture, it similarly communicated its own narratives (the themes of progress, technology, efficiency, and rationality) through its new spaces constructed from simple geometric forms – and also through its bare, industrial looking surfaces. (Thus the absence of information from the surface, articulated in the famous "ornament is crime" slogan by Adolf Loos, itself became a powerful communication technique of modern architecture).

An important design problem of own time is how to combine the new functioning of a surface as an electronic display with new kind of spaces that will symbolize the specificity of our own time.[24] While Venturi fits electronic displays on his buildings that closely follow traditional vernacular architecture, this is obviously not the only possible strategy. A well-known Freshwater Pavilion by NOX/Lars Spuybroek (1996) follows a much more radical approach. To emphasize that the interior of the space constantly mutates, Spuybroek eliminates all strait surface and strait angle; he makes the shapes defining the space appear to move; and he introduces computer-controlled lights that change the illumination of an interior.[25] As described by Ineke Schwartz, "There is no distinction between horizontal and

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[22] See http://prixars.aec.at/history/interactive/2000/E00int_01.htm.

[23] Ibid.

[24] See http://www.manovich.net/IA.

[25] See Ineke Schwartz, "Testing Ground for Interactivity: The Water Pavilions by Lars Spuybroek and Kas Oosterhuis," http://synworld.t0.or.at/level3/text_archive/testing_ground.htm.

vertical, between floors, walls and ceilings. Building and exhibition have fused: mist blows around your ears, a geyser erupts, water gleams and splatters all around you, projections fall directly onto the building and its visitors, the air is filled with waves of electronic sound."[26]

I think that Spuybroek's building is a successful symbol for information age. Its continuously changing surfaces illustrate the key effect of a computer revolution: substitution of every constant by a variable. In other words, the space which symbolizes information age is not a symmetrical and ornamental space of traditional architecture, rectangular volumes of modernism, or broken and blown up volumes of deconstruction – rather, it is space whose shapes are inherently mutable, and whose soft contours act as a metaphor for the key quality of computer-driven representations and systems: variability.

Learning from Prada

Venturi wants to put electronic ornament and electronic iconography on traditional buildings, while Lars Spuybroek, in Freshwater Pavilion, does create a new kind of space but reduces the changing information to abstract color fields and sound. In Freshwater Pavilion information surface functions in a very particular way, displaying color fields rather than text, images, or numbers. Where can we find today interesting architectural spaces combined with electronic displays that show the whole range of information, from ambient color fields to figurative images and numerical data?

Beginning in the mid 1990s, the avant-garde wing of retail industry has begun to produce rich and intriguing spaces, many of which incorporate moving images. Leading architects and designers such as Droog/NL, Marc Newson, Herzog & de Meuron, Renzo Piano and Rem Koolhaas created stores for Prada, Mandarina Duck, Hermes, Comme des Garcons, and other high-end brands; architect Richard Glucksman colloborated with artist Jenny Holzer to create a stunning Helmut Lang's parfumerie in New York which incorporates Holzer's signature use of LCD display. A store featuring dramatic architecture and design, and mixing a restaurant, fashion, design and art gallery became a new paradigm for high-end brands. Otto Riewoldt describes this paradigm using the term "brandscaping" – promoting the brand by creating unique spaces. Riewoldt: "Brandscaping is the hot issue. The site at which good are promoted and sold has to reinvent itself by developing unique and unmistakable qualities."[27]

Rem Koolhaas's Prada store in New York (2002) pushes brandscaping to a new level. Koolhaus seems to achieve the impossible by creating a flagship store for the Prada brand – and at the same time an ironic statement about the functioning of brands as new religions.[28] The imaginative use of electronic displays designed by Reed Kram of Kramdesign is an important part of this statement. On entering the store you discover glass cages hanging from the ceiling throughout the space. Just as a church would present the relics of saints in special displays, here the glass cages contain the new objects of worship – Prada cloves. The special status of

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[26] Ibid.

[27] Otto Riewoldt, qtd. in Mark Hooper, "Sex and Shopping," *ID:* The DNA Issue (2001), 94.

[28] For an insightful analysis of the branding phenomenon, see Naomi Klein, *No Logo* (New York: Picador, 2000).

Prada cloves is further enhanced by placing small flat electronic screens throughout the store on the horizontal shelves right among the merchandize. The cloves are equated to the ephemeral images playing on the screens, and, vice versa, the images acquire certain materiality, as though they are objects. By positioning screens showing moving images right next to cloves the designers ironically refer to what everybody today knows: we buy objects not for themselves but in order to emulate the certain images and narratives presented by the advertisements of these objects. Finally, on the basement level of the store you discover a screen with Prada Atlas. Designed by Kram, it maybe be mistaken for an interactive multimedia presentation of OMA (Office for Metropolitan Architecture which is the name of Koolhaus's studio) research for his Prada's commission. It looks like the kind of stuff brands normally communicate to their investors but not to their consumers. In designing the Atlas as well as the whole media of the store, Kram's goal was to make "Prada reveal itself, make it completely transparent to the visitors."[29] The Atlas lets you list all Prada stores throughout the world by square footage, look at the analysis of the optimal locations for stores placement, and study other data sets that underlie Prada's brandscaping. This "unveiling" of Prada does not break our emotional attachment with the brand; on the contrary, it seems to have the opposite result. Koolhaus and Kram masterfully engage "I know it is an illusion but nevertheless" effect: we know that Prada is a business which is governed by economic rationality and yet we still feel that we are not simply in a store but in a modem church.

It is symbolic that Prada NYC has opened in the same space that was previously occupied by a branch of Guggenheim museum. The strategies of brandscaping are directly relevant to museums and galleries which, like all other physical spaces, now have to compete against the new information, entertainment and retail space: a computer or PDA screen connected to the Net. Although museums in the 1990s have similarly expanded their functionality, often combining galleries, a store, film series, lectures and concerts, design-wise they can learn from retail design, which, as Riewold points out, "has learnt two lessons from the entertainment industry. First: forget the goods, sell thrilling experience to the people. And secondly: beat the computer screen at its own game by staging real objects of desire – and by adding some spice to the space with maybe some audio-visual interactive gadgetry." [30]

In a high-tech society cultural institutions usually follow the industry. A new technology is being developed for military, business or consumer use; after a while cultural institutions notice that some artists are experimenting with it as well, and start incorporating it in their programming. Because they have the function of collecting and preserving the artworks, the art museums today often looks like historical collections of media technologies of the previous decades. Thus one may mistake a contemporary art museum for a museum of obsolete technology. Today, while outside one finds LCD and PDA, data projectors and DV cameras, inside a museum we may expect to find slide projectors, 16 mm film equipment, 3/4-inch video decks.

Can this situation be reversed? Can cultural institutions play an active, even a leading role, acting as laboratories where alternative futures are tested?

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[29] Reed Kram, personal communication with the author, June 5, 2002. For more Kram projects, see www.kramdesign.com/.

[30] Riewoldt, qtd. in Hooper, 2000.

Augmented space – which is slowly becoming a reality – is one opportunity for these institutions to take a more active role.

While many video installations already function as a laboratory for the developing of new configurations of image within space, museums and galleries as a whole could use their own unique asset – a physical space – to encourage the development of distinct new spatial forms of art and new spatial forms of a moving image. In this way they can take a lead in testing out one part of augmented space future.

Having stepped outside the picture frame into the white cube walls, floor, and the whole space, artists and curators should feel at home taking yet another step: treating this space as layers of data. This does not mean that the physical space becomes irrelevant; on the contrary, as the practice of Cardiff and Liberskind shows, it is at the interaction of the physical space and the data that some of the most amazing art of our time is being created.

Augmented space also represents an important challenge and an opportunity for contemporary architecture. As the examples discussed in this essay demonstrate, while many architects and interior designers have actively embraced electronic media, they typically think of it in limited way: as a screen, i.e. as something which is attached to the "real" stuff of architecture: surfaces defining volumes. Venturi's concept of architecture as "information surface" is only the most extreme expression of this general paradigm. While Venturi's logically connects the idea of surface as electronic screen to the traditional use of ornament in architecture and to as such features of vernacular architecture as billboards and window product displays, this historical analogy also limits our imagination of how architecture can use new media. In this analogy, an electronic screen becomes simply a moving billboard, or a moving ornament.

Going beyond surface as electronic screen paradigm, architects now have the opportunity to think of the material architecture they are normally preoccupied with, and the new immaterial architecture of information flows within the physical structure, as one whole. In short, I suggest that the design of electronically augmented space can be approached as an architectural problem. In other words, architects along with artists can take the next logical step to consider the "invisible" space of electronic data flows *as* substance rather than just a void – something that needs a structure, a politics, and a poetics.